

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 16-566 PCT	<b>FOR FURTHER ACTION</b>	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US04/06482	International filing date ( <i>day/month/year</i> ) 03 March 2004 (03.03.2004)	(Earliest) Priority Date ( <i>day/month/year</i> )
Applicant BECKETT GAS, INC		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the Report**

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b.  With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

Certain claims were found unsearchable (See Box No. II)

Unity of invention is lacking (See Box No. III)

4. With regard to the title,

the text is approved as submitted by the applicant.

the text has been established by this Authority to read as follows:

5. With regard to the abstract,

the text is approved as submitted by the applicant.

the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

a. the figure of the drawings to be published with the abstract is Figure No. 4

as suggested by the applicant.

as selected by this Authority, because the applicant failed to suggest a figure.

as selected by this Authority, because this figure better characterizes the invention.

b.  none of the figures is to be published with the abstract.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/06482

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : F24H 3/08  
 US CL : 432/209, 224, 225; 126/91A, 116A, 116R

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 432/209, 224, 225; 126/91A, 116A, 116R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,109,255 A (DIECKMANN et al) 29 August 2000 (29.08.2000), SEE Figure 3b	1-15
A	US 6,450,162 B1 (WANG et al) 17 September 2002 (17.09.2002), SEE Figures 4 & 5	1-15
A	US 5,059,117 A (WILLS) 22 October 1991 (22.10.1991), SEE abstract	1-15
A	US 5,406,933 A (LU) 18 April 1995 (18.04.1995), SEE Figure 1 and column 6, lines 30-column 7, line 2)	1-15
A	US 6,474,328 B1 (FELLS) 05 November 2002 (05.11.2002), SEE column 3	1-15

Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

21 April 2005 (21.04.2005)

Date of mailing of the international search report

25 MAY 2005

Name and mailing address of the ISA/US

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**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US04/06482

**Box IV TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)**

The technical features mentioned in the abstract do not include a reference sign between parentheses (PCT Rule 8.1(d)).

The abstract is too long (PCT Rule 8.1(b)). The abstract must be less than 150 words, or 200 words when no figure is to be published.

**NEW ABSTRACT**

A gas fired furnace capable of operating a 16:1 turndown ratio or greater. The furnace includes a plurality of burners (10) grouped into at least (14a) and second (14b) groups, each group connected to a source of combustible gas through a control valve (30a, 30b, 30c). The control valve (30c) controlling at least one group of burners is of a modulating type having an output proportional to a control signal applied to the valve. The burners fire into associated heat exchanger tubes (20a), each tube having an inlet (24) and an outlet. The tube outlets are connected to a collector chamber (44) that includes a baffle plate (60) that divides the collector into two sections, one of the sections communicating with the outlets of the tubes associated with the first group of burners, the other section communicating with the outlets of the heat exchanger tubes associated with the other group of burners.

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"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

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